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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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24998	7590	06/16/2004	EXAMINER	
DICKSTEIN SHAPIRO MORIN & OSHINSKY LLP			MONDT, JOHANNES P	
2101 L STREET NW			ART UNIT	
WASHINGTON, DC 20037-1526			PAPER NUMBER	
			2826	

DATE MAILED: 06/16/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/603,670

Applicant(s)

CAMPBELL, KRISTY A.

Examiner

Johannes P Mondt

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 29 March 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 11,24,25 and 27-43 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 11,24,25 and 27-43 is/are rejected.
- 7) ☒ Claim(s) 11,24,25,39-42 and 2737 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Information Disclosure Statement

The Information Disclosure Statement filed 03/29/2004 is improper and hence has NOT been considered, because of lack of signature. Applicant is urged to resubmit said Information Disclosure Statement at her earliest convenience and ensure availability of each and every Non-Patent-Literature Document listed thereon, either through previous submission in the parent case or through submission in the present continuation.

Response to Amendment

Amendment filed 03/29/2004 forms the basis of this Official Action. In said Amendment Applicant cancelled claims 1-10, 12-23 and 26. Applicant substantially all remaining claims 11, 24-25, 27-43 through substantial amendment of independent claims 11, 24, 25, 27, 31, 32, 36, 37 and 42. Comments on Remarks in said Amendment is included below under "Response to Arguments".

Response to Arguments

1. Applicant's arguments filed 03/29/2004 have been fully considered but they are not entirely persuasive. In particular, claims 11, 24-25, 27-31 and 37-43 are substantially broader than the corresponding old claims, despite Applicant's allegation that independent "claim 11 has been amended to incorporate additional limitations, including limitations from now cancelled dependent claim 15" (page 9 of Remarks). For instance, new claim 11 does not comprise the limitation a dendrite formed between said first and second electrodes when voltage is applied to said first and second electrodes".

Likewise, claim 24 and claim 25, and claims dependent thereon, as newly amended do not contain the limitation "said germanium selenide glass forming a dendrite between at least two electrodes in response to a voltage applied across said at least two electrodes". Furthermore, the stipulation "electrically coupled to" as replacement for the stipulation "in contact with" in the limitation within claim 11 (second paragraph of the bulk), claim 24 (second paragraph of the bulk), claim 25 (second paragraph of the bulk), claim 27 (second paragraph of the bulk), claim 31 (second paragraph of the bulk), claim 37 (fourth paragraph of the bulk) and claim 42 (fourth paragraph of the bulk), implies a broadening of the claim language. In conclusion, claims 11, 24-25, 27-31 and 37-43 in their new form are herewith examined for the first time and at the earliest possible occasion. Finally, claim 32 recited a stoichiometric value range disclosed in the primary reference, as pointed out in the previous Office Action.

However, the traverse against the cited numerical value for the difference between the claimed range (in percentage) for the stoichiometric parameter value x and the value found in the prior art is persuasive, and hence the rejections of claim 36 and claims dependent thereon have been withdrawn. Therefore, the present Office Action is non-final.

New art has been found and the best art has been applied to the present new claim set.

Claim Objections

2. ***Claims 11, 24-25, 27-37 and 39-42*** are objected to because of the following informalities: the values and value ranges of the stoichiometric parameter should be

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expressed in actual numbers instead of percentages. In particular, in claim 11 the wording "wherein $39 \leq x \leq 42$ " (line 4) should be replaced by " $0.39 \leq x \leq 0.42$ "; in claim 24 (line 3), the wording " $18 \leq x \leq 28$ " should be replaced by " $0.18 \leq x \leq 0.28$ "; in claim 25 the wording "wherein x is about 40" should be replaced by "wherein x is about 0.40"; in claim 27 (line 4) the wording " $18 \leq x \leq 28$ " should be replaced by " $0.18 \leq x \leq 0.28$ "; in claim 28 the wording "wherein $x=23$ " should be replaced by "wherein $x=0.23$ "; in claim 29 the wording "wherein $x = 25$ " should be replaced by "wherein $x=0.25$ "; in claim 30 the wording "wherein $x=20$ " should be replaced by "wherein $x=0.20$ "; in claim 31 (line 3) the wording "wherein $39 \leq x \leq 42$ " should be replaced by " $0.39 \leq x \leq 0.42$ "; in claim 32 (line 3) the wording "wherein $18 \leq x \leq 28$ " should be replaced by " $0.18 \leq x \leq 0.28$ "; in claim 33 the wording "wherein $x=23$ " should be replaced by "wherein $x=0.23$ "; in claim 34 the wording "wherein $x=25$ " should be replaced by "wherein $x=0.25$ "; in claim 35 the wording "wherein $x=20$ " should be replaced by "wherein $x=0.20$ "; in claim 36 (line 3) the wording "wherein $39 \leq x \leq 42$ " should be replaced by "wherein $0.39 \leq x \leq 0.42$ "; in claim 37 (line 6) the wording "wherein $18 \leq x \leq 28$ " should be replaced by " $0.18 \leq x \leq 0.28$ "; in claim 39 the wording "wherein $x=23$ " should be replaced by " $x=0.23$ "; in claim 40 the wording "wherein $x=25$ " should be replaced by "wherein $x=0.25$ "; in claim 41 the wording "wherein $x=20$ " should be replaced by "wherein $x=0.20$ "; in claim 42 (line 6) the wording "wherein $39 \leq x \leq 42$ " should be replaced by " $0.39 \leq x \leq 0.42$ ".

"Appropriate correction is required.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4. ***Claims 11, 31 and 36*** are rejected under 35 U.S.C. 102(e) as being anticipated by Kozicki et al (US 2003/02099728 A1). Kozicki et al teach a memory cell (sections [0010] and [0080]) comprising: a germanium selenide glass comprising silver (section [0054]), said germanium selenide glass 140 (sections [0051]-0054]) having the formula $(\text{Ge}_x\text{Se}_{1-x})_{1-y}\text{Ag}_y$ (because the silver is dissolved into the germanium selenide glass the formula given by Kozicki et al is equivalent to the one claimed, with a as yet unspecified value for the parameter y, except that the substance must be a chalcogenide glass) (section [0054]), wherein the range limitation (in percentage) for the stoichiometric parameter as claimed is met (between 10 and 50%); and y corresponds to a stoichiometric amount of silver suitable to maintain said germanium selenide glass in a non-crystalline state (evidently, since the substance is a germanium selenide glass, “glass” being amorphous, non-crystalline (see, for instance Merriam-Webster’s Collegiate Dictionary, 10th Edition, page 495); and a first electrode 120 and a second

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electrode 130 (section [0051] and Figure 1) electrically coupled to said germanium selenide glass (section [0038]).

With regard to claim 31, the device of claim 11 must necessarily be made in order to function, while claim 31 merely teaches the making of said device of claim 11, except for the limitation “at least two electrodes” instead of the limitation in claim 11 stating “a first electrode and a second electrode”, which does not imply any patentable distinction, and except for the additional limitation in claim 31 that the location of the at least two electrodes “permit said electrodes to apply bipolar charge across said germanium selenide glass”, which is physically equivalent to the additional limitation that said location permits a voltage to be put across said germanium selenide glass (any such voltage implies a bipolar charge and any bipolar charge implies a voltage), and Kozicki et al do teach said additional limitation (see section [0038]).

With regard to claim 36: the memory cell of claim 31 exists solely to be operated. Claim 36 merely describes the method of operation of said memory cell according to Kozicki et al: with reference to the rejection of claim 31, a voltage is applied by Kozicki et al (see section [0012] and section [0038]) across the germanium selenide glass having the formula referred to in said rejection as claimed here, wherein x in the range between 39 and 42 is included in the range by Kozicki et al (see section [0054]), y evidently corresponding to a stoichiometric amount of silver suitable to maintain said germanium selenide glass in a non-crystalline state (by virtue of the non-crystalline nature of glass by its very definition (see again Merriam-Webster's Collegiate

Dictionary, 10th Edition, loc.cit.), said voltage application changing a resistance state of said glass (see section [0012]).

5. **Claims 24, 27-30 and 32-35** are rejected under 35 U.S.C. 102(e) as being anticipated by Kozicki et al (US 2003/0209728 A1). Kozicki et al teach a memory cell (sections [0010] and [0080]) comprising: a germanium selenide glass comprising silver (section [0054]), said germanium selenide glass 140 (sections [0051]-0054]) having the formula $(\text{Ge}_x\text{Se}_{1-x})_{1-y}\text{Ag}_y$ (because the silver is dissolved into the germanium selenide glass the formula given by Kozicki et al is equivalent to the one claimed, with a as yet unspecified value for the parameter y, except that the substance must be a chalcogenide glass) (section [0054]), wherein the range limitation (in percentage) for the stoichiometric parameter as claimed is met (between 10 and 50%); and y corresponds to a stoichiometric amount of silver suitable to maintain said germanium selenide glass in a non-crystalline state (evidently, since the substance is a germanium selenide glass, "glass" being amorphous, non-crystalline (see, for instance Merriam-Webster's Collegiate Dictionary, 10th Edition, page 495); and at least two electrodes 120 and 130 (section [0051] and Figure 1) electrically coupled to said germanium selenide glass (section [0038]).

With regard to claim 27, the device of claim 24 necessarily needs to be made in order to function. Claim 27 merely states the device of claim 24 to be made, except for the following additional limitation: that said at least two electrodes electrically coupled to said germanium selenide glass be coupled "at locations which permit said glass to

transition between high and low resistance states in response to signals applied to said electrodes". However, Kozicki et al also teach said additional limitation (section [0012]).

With regard to claims 28-30: the stoichiometric parameter x in percentage is taught by Kozicki et al to cover the range from 10 to 50 percent (see section [0054]) in which range the specific instances as claimed by Applicant, be it from 18 to 28 percent as in claim 27, 39 to 42 percent as in claim 11, or 23, 25 or 23 percent as in claims 28, 29 and 30, respectively, are located.

With regard to claims 32-35: the method of using the memory cell as disclosed by Kozicki et al comprises: applying a voltage across the germanium selenide glass 140 (see Figure 1 and section [0038]) with formula $(\text{Ge}_x\text{Se}_{1-x})_{1-y}\text{Ag}_y$ with x within the claimed range (in percentage) between 18 and 28 (see section [0054]) (claim 32, in fact in the range between 10 and 50%; see section [0054]), i.e., in a range containing the value claimed in either claim 33 (x=23 percent), claim 34 (25 percent), or claim 35 (20 percent), with y corresponding to a stoichiometric amount of silver suitable to maintain said germanium selenide glass in a non-crystalline state (glass indeed is in the non-crystalline state by definition of "glass" (Merriam-Webster's Collegiate Dictionary, 10th Edition, loc.cit.), said voltage application changing a resistance state of said glass by virtue of changing the resistance of said glass (see section [0012]).

6. **Claim 25** is rejected under 35 U.S.C. 102(e) as being anticipated by Kozicki et al (US 2003/0209728 A1). Kozicki et al teach a memory cell (sections [0010] and [0080]) comprising: a germanium selenide glass comprising silver (section [0054]), said

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germanium selenide glass 140 (sections [0051]-0054]) having the formula $(\text{Ge}_x\text{Se}_{1-x})_{1-y}\text{Ag}_y$ (because the silver is dissolved into the germanium selenide glass the formula given by Kozicki et al is equivalent to the one claimed, with a as yet unspecified value for the parameter y, except that the substance must be a chalcogenide glass) (section [0054]), wherein the range limitation (in percentage) for the stoichiometric parameter as claimed is met because Kozicki et al teach x to range between 0.1 and 0.5 in which the claimed range, in this case a neighbourhood of 40% is fully embedded; and y corresponds to a stoichiometric amount of silver suitable to maintain said germanium selenide glass in a non-crystalline state (evidently, since the substance is a germanium selenide glass, "glass" being amorphous, non-crystalline (see, for instance Merriam-Webster's Collegiate Dictionary, 10th Edition, page 495); and at least two electrodes 120 and 130 (section [0051] and Figure 1) electrically coupled to said germanium selenide glass (section [0038]).

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. ***Claim 37 and 39-42*** are rejected under 35 U.S.C. 103(a) as being unpatentable over Kozicki et al (US 2003/0209728 A1) in view of Brown et al (5,892,826). Kozicki et al teach a memory cell comprising a germanium selenide glass 140 (see section [0038])

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having the formula $(\text{Ge}_x\text{Se}_{1-x})_{1-y}\text{Ag}_y$ wherein in percentage x is in between 18 and 28 inclusive (a range between 10 and 50 is disclosed, see section [0054]) and y corresponds to a stoichiometric amount of silver suitable to maintain said germanium selenide glass in a non-crystalline state by virtue of the non-crystalline nature of glass by its very definition (see Merriam Webster's Collegiate Dictionary, 10th Edition, loc.cit.); and at least two electrodes 120 and 140 (section [0038]) electrically coupled to said germanium selenide glass changing a resistance state in response to application of a voltage across said at least two electrodes (section [0012]). Kozicki et al do not necessarily teach the further limitations that said germanium selenide glass is comprised in a processor system, said processor system also comprising a processor and an integrated circuit coupled to said processor, at least one of said processor and integrated circuit including said memory cell. However, it would have been obvious to include said further limitations in view of Brown et al, who teach a processor system comprising a processor 20 and integrated circuit coupled to said processor (see claim 1 by Brown et al), at least one of said processor and integrated circuit including a memory cell 122. Motivation to include the teaching by Brown et al in the invention by Kozicki et al stems from the obvious application of non-volatile memory cells (invention by Kozicki et al) to non-volatile memory cell containing data processors (see Figure 2 in Brown et al).

On claims 39-41: the values 23, 25, and 20, in percentage, for the stoichiometric parameter x are taught through the teaching of the range from 10 to 50 in percentage by Kozicki et al (section [0054]).

On claim 42: Kozicki et al teach a memory cell comprising a germanium selenide glass 140 (see section [0038]) having the formula $(\text{Ge}_x\text{Se}_{1-x})_{1-y}\text{Ag}_y$ wherein in percentage x is in between 18 and 28 inclusive (a range between 10 and 50 is disclosed, see section [0054]) and y corresponds to a stoichiometric amount of silver suitable to maintain said germanium selenide glass in a non-crystalline state by virtue of the non-crystalline nature of glass by its very definition (see Merriam Webster's Collegiate Dictionary, 10th Edition, loc.cit.); and at least two electrodes 120 and 140 (section [0038]) electrically coupled to said germanium selenide glass changing a resistance state in response to application of a voltage across said at least two electrodes (section [0012]). Kozicki et al do not necessarily teach the further limitations that said germanium selenide glass is comprised in a processor system, said processor system also comprising a processor and an integrated circuit coupled to said processor, at least one of said processor and integrated circuit including said memory cell. However, it would have been obvious to include said further limitations in view of Brown et al, who teach a processor system comprising a processor 20 and integrated circuit coupled to said processor (see claim 1 by Brown et al), at least one of said processor and integrated circuit including a memory cell 122. Motivation to include the teaching by Brown et al in the invention by Kozicki et al stems from the obvious application of non-volatile memory cells (invention by Kozicki et al) to non-volatile memory cell containing data processors (see Figure 2 in Brown et al).

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9. **Claims 38 and 43** are rejected under 35 U.S.C. 103(a) as being unpatentable over Kozicki et al and Brown et al as applied to claim 38 and to claim 42, and further in view of Yeh (6,200,870 B1). Although Kozicki et al nor Brown et al necessarily teach the further limitation that processor and the integrated circuit to be integrated on one chip it would have been obvious to include said further limitation in view of Yeh, who teach as prior art the processor and integrated circuit to be integrated on the same chip for the specific purpose of increased speed (col. 1, l. 10-16), from which increased speed motivation exists to combine the teaching by Brown et al in this regard with the invention by Kozicki et al.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Johannes P Mondt whose telephone number is 571-272-1919. The examiner can normally be reached on 8:00 - 18:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nathan J Flynn can be reached on 571-272-1915. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

JPM
June 12, 2004

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